

A REVISION OF THE CYPRESS-FEEDING MOTHS OF THE GENUS *CUTINA* WALKER (LEPIDOPTERA: NOCTUIDAE)

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Abstract.—The genus *Cutina* consists of 4 species that are associated with cypress (*Taxodium* spp.) swamps throughout the southeastern United States. Two species are described as new: *C. aluticolor*, *n.sp.*, and *C. arcuata*, *n.sp.* Redescriptions of *C. albopunctella* Walker and *C. distincta* (Grote) are provided. *C. albopunctella* has been reared on bald cypress, *Taxodium distichum* (L.) L.C. Rich. A phylogenetic analysis of *Cutina* indicates that *C. albopunctella* is considered basal with *C. distincta* the sister species to the *C. aluticolor* + *C. arcuata* clade, with *C. aluticolor* and *C. arcuata* sister species.

Key Words: *Cutina*, Noctuidae, phylogeny, cypress, *Taxodium*

The North American genus *Cutina*, subfamily Catocalinae (Poole 1989), was only known from two species *C. albopunctella* Walker and *C. distincta* (Grote). In this revision, we describe two additional species, illustrate all species, and present a phylogeny of the genus.

Cutina albopunctella was reared by one of us (DCF) on bald cypress (*Taxodium distichum* (L.) L.C. Rich) from eggs obtained from a live caught female. All species of *Cutina* are associated with wet habitats such as swamps, ponds, lake margins, floodplains, and river banks that contain cypress and tupelo (*Nyssa* spp.). The distribution of cypress and tupelo (Duncan and Duncan 1988) is virtually the same as *Cutina* in the southeastern United States (Figs. 41–44). *Cutina* is probably multi-brooded, at least in the southern portion of its range, with a seasonal flight period from mid-February to mid-September.

MATERIAL AND METHODS

Abbreviations for collections used in this study are: AMNH (American Museum

of Natural History, New York, New York); BM (Bryant Mather, Jackson, Mississippi); BMNH (The Natural History Museum, London); ERH (Eric H. Metzler, Columbus, Ohio); FSCA (Florida State Collection of Arthropods, Gainesville, Florida); JBS (J. Bolling Sullivan, North Carolina); JRH (J.R. Heitzman, Missouri); MSU (R.L. Brown, Mississippi State University); ULK (University of Louisville, Louisville, Kentucky); USNM (National Museum of Natural History, Smithsonian Institution, Washington, D.C.); VAB (V.A. Brou, Louisiana); and VSA (V.S.A. Albu, Ohio). A total of 1032 specimens were examined during the course of this study. All data in material examined sections refer to what is printed on specimen labels. All specimens examined during this study were labeled with a bar code having a unique number (USNM ENT 00000000) and entered in a database that will be maintained in the Department of Entomology, Smithsonian Institution, Washington, D.C.

Cutina Walker

Cutina Walker 1866:1734.—Barnes and McDunnough 1917:82.—Kimball 1965:127.—Nye 1975:146.—Franclemont and Todd 1983:127.—Poole 1989:301. Type species: *Cutina albopunctella* Walker, 1866, by monotypy.

Description.—*Head* (Fig. 2): Eyes well developed. Ocelli present. Labial palpus upright; scales on middle segment expanded ventrally; apical segment exposed. Haustellum well developed. *Thorax*: Protibia with an apical spine; epiphysis less than 0.5 times length of tibia. Mesotibia with 3–9 spines (Figs. 3–4); one pair of uneven apical spurs. Metatibia with two pair of uneven apical spurs. *Forewing* (Fig. 1): Small moths with length 7.2–14.0 mm. Ground color gray to brown. Accessory cell present. $R_3 + R_4$ stalked just beyond middle; R_5 to termen; M_2 and M_3 connate. Outer margin with black spots. *Hindwing* (Fig. 1): Length 7.0–11.2 mm. Female with 3 frenular bristles. R_5 and M_1 connate; M_3 and CuA_1 stalked just beyond M_2 . Ground gray to brown. *Male genitalia* (Figs. 29–36): Gnathos present. Valve narrow to sickle-shaped. Aedoeagus curved. Vesica complex. *Female genitalia* (Figs. 37–40): Eighth sternite with a pair of large elongate lobes; 2 dark scale patches dorsal to these lobes. Ductus bursae short. Corpus bursae covered with minute spicules. Appendix bursae present.

Distribution.—*Cutina* occurs from southeastern Maryland to southern Florida, along the Gulf Coast from southwestern Florida to eastern Texas and western Louisiana, throughout Mississippi to southeastern Oklahoma, Missouri and extreme southwestern Indiana and western Kentucky.

Discussion.—Species of *Cutina* are small moths with forewing ground color gray to brown and hindwing ground color buff to light brown. The pattern can be longitudinally streaked or with median and postmedian lines distinct. Lobes of the 8th sternite in the females are covered with scales and

can be seen without dissection. Upon dissection these lobes are kidney-shaped and have an associated scale patch dorsal to them.

One of us (DCF) earlier assumed that more than four species might be represented in the highly variable material available for examination. The peninsular Florida forms of *C. albopunctella* and *C. arcuata* appeared especially likely to be distinct. However, no clear evidence was found to support this.

All species of *Cutina* can be readily distinguished by comparing specimens to the illustrations of adults in Figs. 5–28.

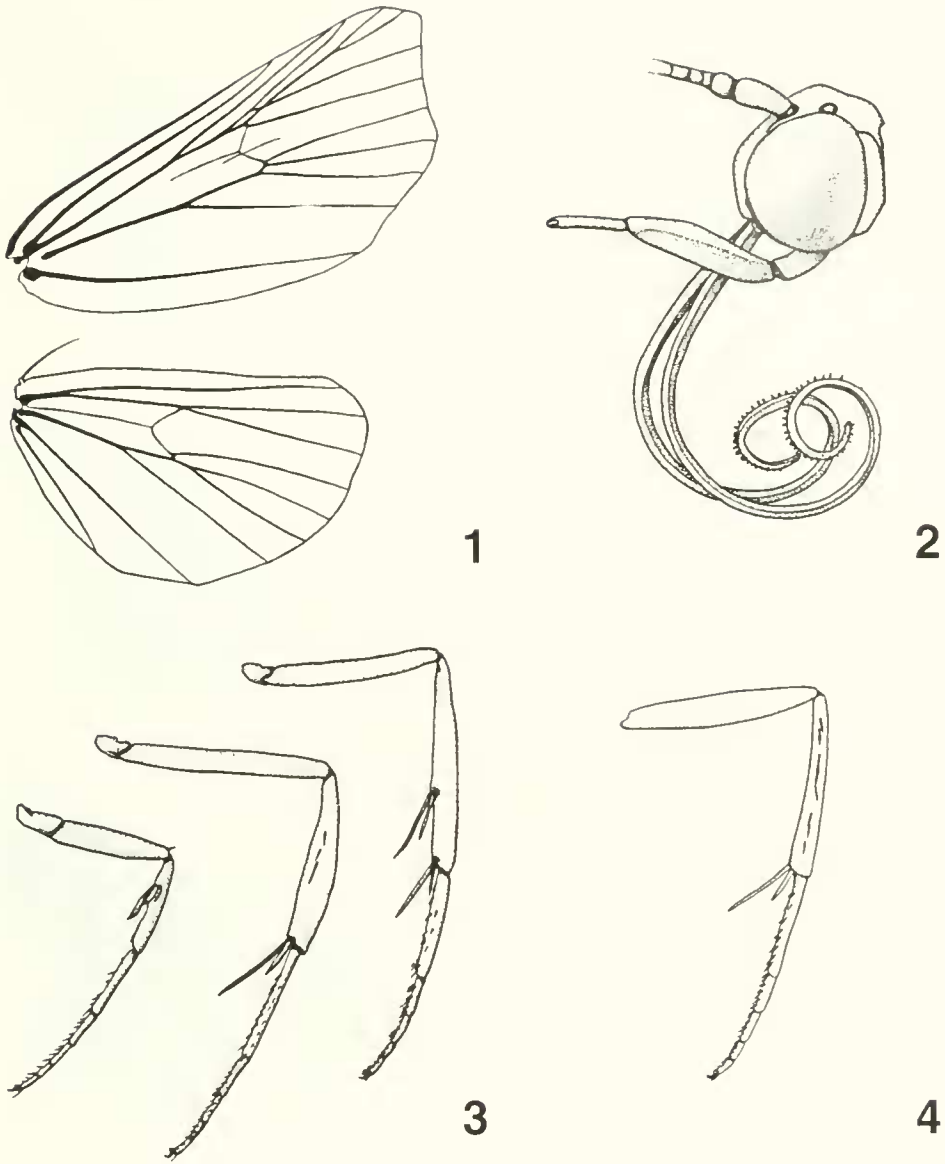
Cutina albopunctella Walker
(Figs. 4, 5–12, 29–30, 37, 41)

Cutina albopunctella Walker 1866:1735.—Hampson 1913:157.—Barnes and McDunnough 1917:82.—Barnes and Benjamin 1925:198.—Kimball 1965:127.—Franclemont and Todd 1983:127.—Poole 1989:301.

Erastria strigularia Smith 1900:173.—Dyar 1902:209.—Barnes and McDunnough 1917:82, (junior synonym).—Kimball 1965:127.—Todd 1982:201.—Franclemont and Todd 1983:127.—Poole 1989:301.

Diagnosis.—Forewing ground color light brown with longitudinal white streaks from base to termen (peninsular Florida), or ground color brown dusted with white scales (non-peninsular Florida). Mesotibia with 6–9 small spines. Uncus diamond shaped. Sinus vaginalis rectangular-shaped caudally and lobes of 8th sternite trapezoidal.

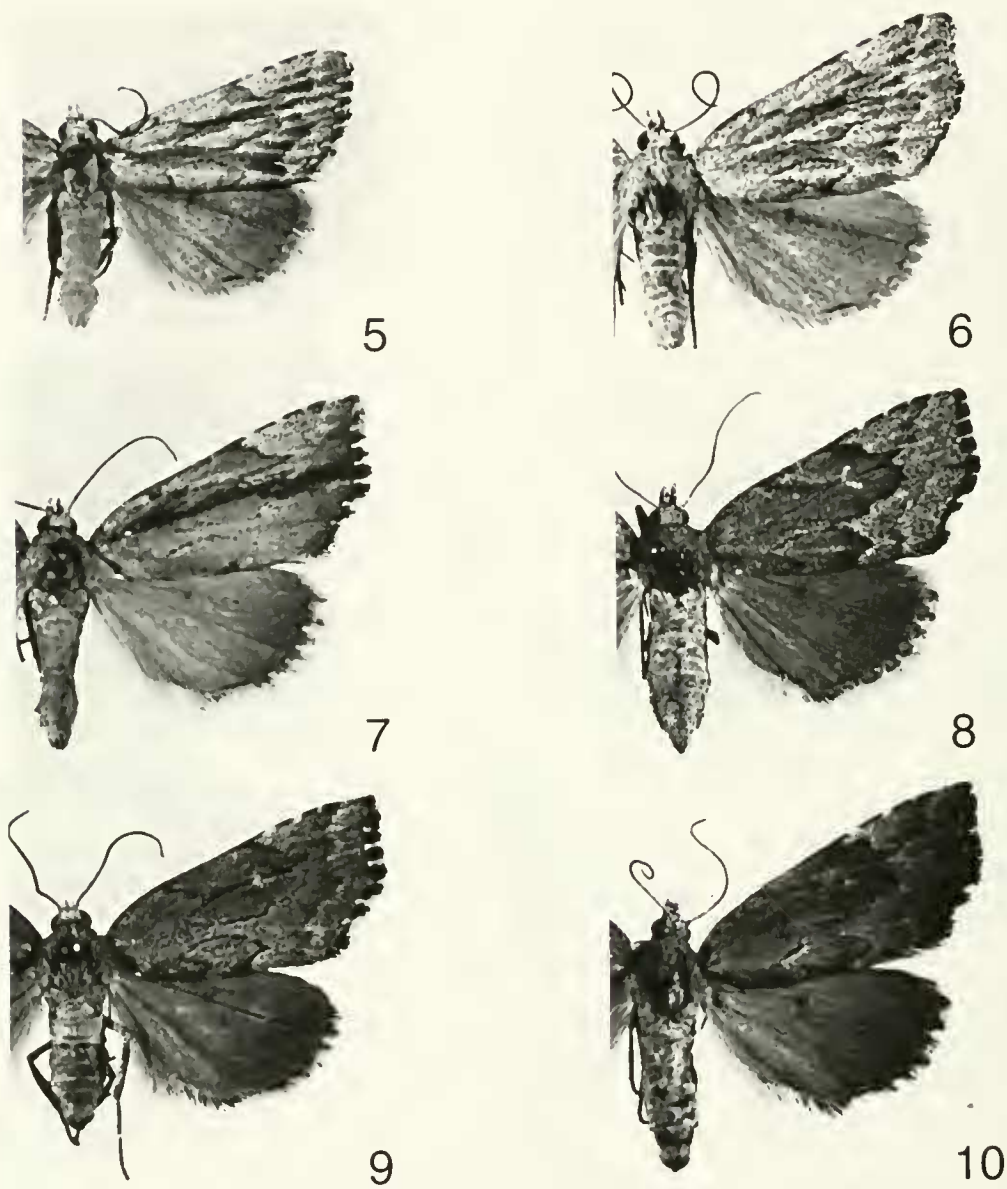
Description.—*Head*: Vertex white, mixed with light gray. Labial palpus light gray bordered by white ventrally. Antennal scape white mixed with light gray; scales on flagellum white to light brown apically. *Thorax*: Patagium white, mixed with light gray. Metanotum white, mixed with light gray; scale tuft absent. Tegula white, mixed with light gray. Venter white. Legs light brown



Figs. 1-4. *Cutina atuticolor*. 1, Wing venation. 2, Head, lateral. 3, Legs. 4, *C. albopunctella* middle leg.

and white with white apical tibial band; 6-9 spines on mesotibia. Tarsi light brown with white apical band. *Forewing* (Figs. 5-12): Male length 11.2-14 mm. Female length 11.8-13.8 mm. Ground color light brown with longitudinal white streaks from base to termen. Basal line absent. Antemedial line absent. Postmedial line absent. Subterminal line white (obscure in some specimens). Longitudinal streaks of white

scales overlying ground color. Ovate patch along posterior margin, outlined with dark scales. *Hindwing*: Male length 8.4-11.2 mm. Female length 9.4-10.6 mm. Ground color buff. *Abdomen*: Dorsum light brown; venter light brown. *Male genitalia* (Figs. 29-30): Uncus with subapical diamond-shaped expansion. Tegumen with pair of lateral projections at basal third. Valve widest at base, margins straight; costal projec-



Figs. 5-10. *Cutina albopunctella*, adults, 3× natural size. 5, ♂, Florida, Highlands Co., USNM ENT 00059264, (AMNH). 6, ♂, Florida, Collier Co., USNM ENT 00059255, (USNM). 7, ♂, South Carolina, Charleston Co., USNM ENT 00059471, (USNM). 8, ♀, South Carolina, Charleston Co., USNM ENT 00059475, (USNM). 9, ♂, South Carolina, Charleston Co., USNM ENT 00059494, (USNM). 10, ♂, South Carolina, Charleston Co., USNM ENT 00059489, (USNM).

tion at basal third; ampulla a swollen knob; harpe a swollen knob, smaller than ampulla; cucullus apex rounded. Apex of aedoeagus pointed, with dorsal margin projecting beyond ventral margin into vesica. Vesica with distal diverticula enlarged, bulbous.

Female genitalia (Fig. 37): Sinus vaginalis well sclerotized laterally and ventrally, rectangular-shaped caudad. Lobes of 8th sternite trapezoidal; lateral margin straight. Signa longer on anterior half of corpus bursae than on posterior half.

Type material.—Holotype, BMNH. *Cutina albopunctella* Walker was described from one male from the "United States" in the BMNH (from E. Doubleday). The type locality was not given, but Doubleday collected at "St. John's Bluff, East Florida" in March and April 1838. This was on the south side of the St. John's River at or near the present site of Fort Caroline National Memorial, Jacksonville (Ferguson 1963). The holotype, based on a color photograph, is clearly of the smaller peninsular Florida form with longitudinally white-striated forewings, although other specimens examined indicate that the Jacksonville area is at the interface or blend zone between this southern form with exaggerated striation and the larger, more grayish form occurring northward.

Erastria strigularia J. B. Smith was described from "Florida (Mrs. Slosson), 1 female only." All that remains of the holotype in the AMNH are four wings mounted on a card. The frenulum on the left hindwing shows that the specimen was a male, not a female as indicated in the original description (Todd 1982: 201). Annie Trumbull Slosson spent winters at various places in southern Florida (Miami, Punta Gorda, Charlotte Harbor), and there is no way to determine the specific type locality (Dougherty 1990). The holotype again represents the peninsular Florida form of *C. albopunctella*.

Type locality.—United States.

Host.—Bald Cypress, *Taxodium distichum* (L.) L.C. Rich. Larvae from eggs laid by a female taken in the Okefenokee Swamp, Georgia, were reared to maturity on this host by DCF.

Immature stages.—Mature larva 32 mm in length. Abdominal prolegs on A5, A6, and A10 fully developed. A pair of small, rudimentary bumps marking position of prolegs on A4. Bright green with well defined white subdorsal and spiracular stripes. A thinner pair of addorsals and faintest trace of a pale subventral and yellowish midventral stripe. Head green with exten-

sions of whitish subdorsals. Legs green, space between addorsals darker green, marking position of dorsal vessel.

Flight period.—Records for end of February, end of March through end of September.

Distribution (Fig. 41).—From southern Florida north to coastal Georgia, South Carolina, North Carolina, and eastern Maryland; southern Alabama, Louisiana and Mississippi north to eastern Mississippi, southeastern Missouri, southern Indiana, and west to western Louisiana and eastern Texas.

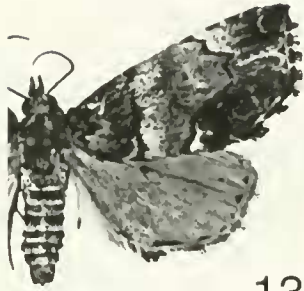
Material examined.—183 ♂ and 157 ♀. ALABAMA: Baldwin Co., Bon Secour N.W.R., 11–16 May 1994, R.L. Brown & D. Pollock, 2 ♂, 2 ♀ (MSU); 1 mi S Claiborne Dam, 29 May 1995, R.L. Brown, 1 ♂, 30 May 1995, R.L. Brown & J. MacGown, 1 ♂ (MSU) Monroe Co., Haines Island Park, 30 May 1995, J. MacGown & R.L. Brown, 1 ♂ (MSU). FLORIDA: [no specific locality], E.T. Owen Coll., 1 ♂, (USNM); Collier Co., Big Cypress Swamp Natl. Pres., Turner Rd., 1.5 mi N of US Hwy 41, 18 March 1997, 1 ♂, 2 ♀, 5 mi S of Hwy 41, 20 March 1997, 2 ♂, 1 ♀, M.G. Pogue (USNM); Fakahatchee Strand, Big Cypress Swamp, 24 February 1985, D.C. Ferguson, ♂ genitalia slide USNM 56789 [green label], 11 ♂ (USNM); Fakahatchee Strand, Jane's Scenic Dr., near Copeland, 28 Mar. 1986, H.D. Baggett, 2 ♀ (USNM); Fakahatchee Strand Preserve, 3.4 mi NW Copeland, 17 March 1997, M.G. Pogue, 1 ♂, 1 ♀ (USNM); Collier-Seminole State Park, 18 June 1987, T.L. Schiefer, 1 ♀ (MSU); Naples, 1 June 1995, 2 ♀ (JG). Duval Co., Jacksonville, Jax. Police Acad., 5 June 1980, H.D. Baggett, 1 ♀ (USNM). Flagler Co., Crescent Lake, Shell Bluff Landing, 12 May 1990, H.D. Baggett, 1 ♂, genitalia slide USNM 44535 [green label] (USNM). Hernando Co., Weeki Wachee Springs, 5 June 1960, J.F. May, 1 ♂, genitalia slide USNM 56790 [green label] (USNM). Highlands Co., Archbold Biol. Sta., 12–19 June 1955, A.K. Wyatt, 1 ♂



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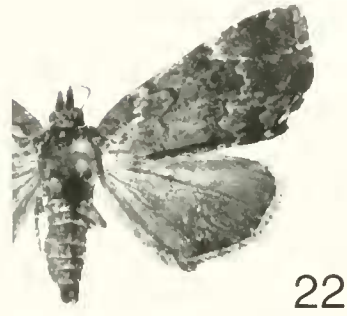


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Figs. 11–18. Adults, 3× natural size. 11, *Cutina albopunctella*, ♂, South Carolina, Charleston Co., USNM ENT 00059639, (USNM). 12, *C. albopunctella*, ♂, Missouri, Wayne Co., USNM ENT 00059615, (USNM). 13, *C. distincta*, ♀, Florida, Collier Co., USNM ENT 00059920, (USNM). 14, *C. distincta*, ♂, South Carolina, Charleston Co., USNM ENT 00059958, (USNM). 15, *C. distincta*, ♀, South Carolina, Charleston Co., USNM ENT 00059973, (USNM). 16, *C. distincta*, ♂, Louisiana, St. John the Baptist Parish, USNM ENT 00060016, (VAB). 17, *C. distincta*, ♀, holotype, [No locality], Col. B. Neumögen, (USNM). 18, *C. inquieticolor* Dyar (synonym of *C. distincta*), ♀, Lectotype, Type No. 25422, Florida, Hillsborough Co., (USNM).

(USNM). Hillsborough Co., Stemper, 16 Sep. 1911, Barnes Coll., 1 ♀ (USNM); Tampa, 22 Apr. 1982, 9 June 1981, H.D. Baggett, 2 ♀ (FSCA). Lee Co., Ft. Myers,

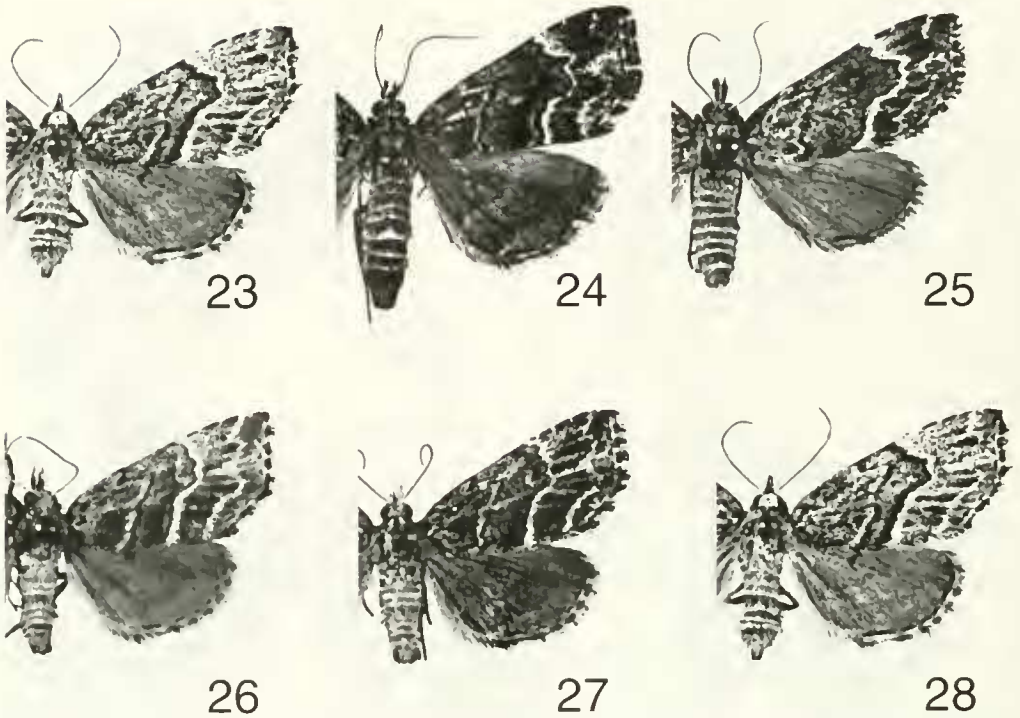
5 May 1978, C.V. Covell, 2 ♂, 2 ♀, 2 ♀ genitalia slides USNM 56791, 57212 [green labels], Apr. 16–23, 4 ♂, May 1–7, Barnes Coll., 2 ♂ (USNM). Liberty Co., Torreya



Figs. 19–22. *Cutina aluticolor*, adults, 3× natural size. 19, ♂, Holotype USNM 105501, Florida, Putnam Co., USNM ENT 00059550, (USNM). 20, Florida, Putnam Co., USNM ENT 00059541. 21, Florida, Putnam Co., USNM ENT 00059639. 22, Florida, Putnam Co., USNM ENT 00059555.

State Park, 21 May 1982, H.D. Baggett, 1 ♂ (FSCA). Marion Co., Ocala National Forest, 3 June 1995, J. Glaser, 1 ♀ (JG). Monroe Co., Everglade, Apr. 8–15, Barnes Coll., 1 ♂ (USNM). Pinellas Co., St. Petersburg, May, 2 ♀, September, 1 ♂, Barnes Coll., (USNM), [no date], O. Bucholz, 1 ♂ (AMNH). Polk Co., Lakeland, 11 Aug. 1941, J.R. Malloch, 1 ♂ (USNM). St. Johns Co., Hastings, J.R. Smith, 1 ♂ (USNM). Sumter Co., Withlacoochie State Forest, 31 May 1995, 1 ♀ (JG). GEORGIA: Charlton Co., Boardwalk trail, Okefenokee Swamp, nr. Folkston, 26 Mar. 1990, 11 ♂, 9 ♀, 2 ♂ genitalia slides USNM 44538, 44536 [green labels], 28 Mar. 1990, D.C. Ferguson, 20 ♂, 35 ♀ (USNM); Boardwalk trail, Chesser Is., Okefenokee National Wildlife Refuge, 16 Apr. 1991, 1 ♂, 8 ♀, 18 Apr. 1991, 1 ♀, 19 Apr. 1991, D.C. Ferguson, 1 ♂, 1 ♀ (USNM); Chesser Is. Homestead, Okefenokee National Wildlife Refuge, 16 Apr. 1991, 1 ♀, 19 Apr. 1991, 1 ♂, 3 ♀, D.C.

Ferguson (USNM); Trader's Hill, Folkston, 17 Apr. 1991, D.C. Ferguson, 1 ♂ (USNM). Clinch Co., 7 mi NE Fargo, 7 May 1981, D.C. Ferguson, 1 ♂ (USNM); Ware Co., Okefenokee Swamp, 12 May 1988, J.F.G. Clarke, 1 ♀ (USNM). INDIANA: Posey Co., Gray Estates, 30 June 1995, Enz & Covell, 3 ♂ (ULK). LOUISIANA: Bossier Par., Barksdale A.F.B., 17 Apr. 1996, 1 ♂, 1 ♀, 25 Apr. 1996, 1 ♂, 3 June 1996, 1 ♂, 18 June 1996, 1 ♂, 11 July 1996, 2 ♂, 14 Aug. 1996, 1 ♀, D.M. Pollock, 20 May 1996, R.L. Brown, 1 ♂ (MSU). Calcasieu Par., S.H. Jones State Park, 19–23 May 1993, R.L. Brown & D. Pollock, 9 ♂, 2 ♀ (MSU). Plaquemines Par., Callender Field, 28 Aug. 1971, 1 ♀ (EHM). St. Charles Par., Bonnet Carre Spillway, 5 May 1972, 1 ♀ (EHM). St. John the Baptist Par., Edgard, 27 May 1977, 1 ♂, 7 June 1981, 1 ♀, 20 June 1977, 1 ♂, V.A. Brou (VAB). St. Tammany Par., 4.2 mi NE Abita Springs, sec. 24, T6S, R12E, 4 Apr. 1984, V.A. Brou, 1



Figs. 23–28. *Cutina arcuata*, adults, 3× natural size. 23, ♂, Holotype USNM 105502, South Carolina, Charleston Co., USNM ENT 00059837, (USNM). 24, ♀, South Carolina, Charleston Co., USNM ENT 00059827, (USNM). 25, ♂, South Carolina, Charleston Co., USNM ENT 00059835, (USNM). 26, ♂, Florida, Collier Co., USNM ENT 00059792, (USNM). 27, ♂, Florida, Collier Co., USNM ENT 00059793, (USNM). 28, ♂, Florida, Putnam Co., USNM ENT 00059744, (USNM).

♀ (VAB). Webster Par., Lake Bistineau St. Pk., 11 May 1980, 2 ♂, 27 May 1979, 1 ♂, [no collector] (VAB), 20 May 1996, R.L. Brown, 2 ♀ (MSU). MARYLAND: Worcester Co., Pocomoke St. For., 30 July 1990, 1 ♂, 16 July 1993, 1 ♀, J. Glaser, (JG); Nassawango Preserve, 24 July 1989, J. Glaser, 3 ♀ (JG); Shad Landing, 20 May 1985, 1 ♂, 30 July 1990, 2 ♀ (JG); Pocomoke State Forest, 16 July 1993, J. Glaser, 1 ♀ (JG); 7 mi N. of Pocomoke, Blades Rd., 16 June 1997, 1 ♂, 2 ♀ (JG). MISSISSIPPI: George Co., Mixon Lakes, 8–9 Apr. 1994, R.L. Brown & D. Pollock, 1 ♂, 2 ♀ (MSU). Hancock Co., M.T.F., 20 Mar. 1992, 1 ♀, 24 Mar. 1992, 1 ♂, 15 Apr. 1992, 1 ♀, 20 Apr. 1992, 2 ♂, 3 May 1992, 1 ♀, 14 May 1992, 1 ♀, 15 May 1992, 1 ♂, 2 June 1992, 1 ♀, 5 July 1992, 1 ♂, 7 July 1992, 1 ♂, 2 ♀, 9 July 1992, 1 ♀, 15

July 1992, 1 ♀, 18 July 1992, 1 ♂, 25 July 1992, 1 ♀, 9 Aug. 1992, 4 ♂, 1 ♀, ♀ genitalia slide USNM 44539 [green label], 13 Sep. 1991, 1 ♀, R. Kergosien (BM). Harrison Co., Lizana, 9 June 1992, 1 ♀, 27 July 1991, 1 ♀, R. Kergosien (BM); Long Beach, 4 Aug. 1991, R. Kergosien, 1 ♂ (BM). Jackson Co., Blk. Cr., nr. George-Jacoline, 1 Aug. 1991, Rick Kergosien collr., 1 ♂, 3 ♀ (BM); O. Sprgs., 3 June 1979, R. Kergosien, 1 ♀ (BM), I-10 at Escatawpa River, 13 Apr. 1991, R.L. Brown, 2 ♂, 1 ♀ (MSU). Noxubee Co., Noxubee Wild. Ref., 26 Apr. 1987, R.L. Brown, 1 ♂ (USNM), 16 Aug. 1984, S. Cho, 1 ♂, 14 Apr. 1993, D.M. Pollock, 1 ♂, 1 ♀ (MSU). Oktibbeha Co., T18W, R14E. Sec. 23, 10 May 1988, R.L. & B.B. Brown, 1 ♂ (USNM), 30 June 1988, R.L. & B.B. Brown, 1 ♀ (MSU). Pearl River Co., 3 mi

east Bogalusa, 17 Aug. 1991, R. Kergosien, 1 ♂, 2 ♀ (BM). Tishomingo Co., Tish. St. Pk., 11 Apr. 1986, R.L. Brown, 1 ♀ (USNM). MISSOURI: Stoddard Co., Otter Slough Wildlife Area, 25 Aug. 1983, J.R. Heitzman, Cypress-Tupelo Swamp with associated southeastern forest, 3 ♂ (JRH). Wayne Co., Markham Sprgs. Nat. For. Cmpg., 7 June 1984, 1 ♀, 21 July 1984, 6 ♂, 5 ♀, ♂ genitalia slide USNM 44538, ♀ genitalia slide USNM 56802 [green labels], J.R. Heitzman, Cane, Cypress, Tupelo, pine, & deciduous forest (JRH). NORTH CAROLINA: Craven Co., Croatan For. Rd. 167, 21 July 1993, J. Bolling Sullivan, 1 ♀ (USNM); North Harlowe, 20 Mar. 1990, 1 ♂ (USNM), 23 Mar. 1990, 1 ♂ (JBS), 1 Apr. 1990, 1 ♂ (JBS), 2 Apr. 1990, 1 ♂ (USNM), 14 Apr. 1990, 1 ♂ (JBS), 17 Apr. 1991, 1 ♂ (JBS), 21 Apr. 1990, 2 ♂, 1 ♀, 8 May 1990, 1 ♂, 30 June 1990, 2 ♂, 1 ♀ (USNM), 4 July 1990, 1 ♀ (JBS), 7 July 1990, 1 ♂, 19 July 1990, 1 ♂, 24 July 1978, 1 ♀, 29 July 1990, 1 ♂, 17 Aug. 1990, 1 ♂ (USNM), 1 ♀ (JBS), J. Bolling Sullivan, New Hanover Co., Car. Beach State Park, E. of Dow Rd., 1–10 Aug. 1994, J. Bolling Sullivan, Richard Broadwell, & Brad Smith, UV trap, coastal fringe sandhill, 1 ♂ (USNM). SOUTH CAROLINA: Charleston Co., McClellanville, 5 May 1969, 1 ♀, 7 May 1969, 1 ♂, R.B. Dominick, Charles R. Edwards, light (USNM); Wedge Plantation, McClellanville, 8 Apr. 1977, 1 ♂, 21 Apr. 1974, 3 ♂, 24 Apr. 1974, 1 ♀, 1 May 1972, 1 ♂, 2 June 1978, 1 ♀, genitalia slide USNM 56576 [green label], 5 June 1978, 1 ♂, 2 ♀, 3 Aug. 1968, 5 ♂, 5 ♀, ♂ genitalia slide USNM 57210, ♀ genitalia slide USNM 57211 [green labels], 5 Aug. 1968, 2 ♂, 7 Aug. 1968, 2 ♀, 13 Aug. 1968, 1 ♂, 19 Aug. 1971, 2 ♂, 26 Aug. 1981, 1 ♂, 2 ♀, D.C. Ferguson (USNM); Wedge Plantation, South Santee River, 28 Mar. 1967, 2 ♂, 1 ♀, 29 Mar. 1967, 1 ♂, 1 ♀, 31 Mar. 1967, 1 ♂, 1 ♀, 6 Aug. 1968, 3 ♂, 1 ♀, D.C. Ferguson (USNM), 17 July 1967, 1 ♀, 27 July 1967, 1 ♂, 28 July 1967, 1 ♂, 30 July 1967, 1 ♂, James W. Porter (USNM),

4 Aug. 1967, 1 ♂, genitalia USNM 56582, James W. Porter (USNM). TEXAS: Harris Co., [no specific locality], June 16–23, Barnes Coll., 1 ♂ (USNM). Harrison Co., Cado Lake St. P., 18 Aug. 1985, 1 ♂, 1 ♀, 29 Aug. 1985, 1 ♀, E.C. Knudson; Jasper Co., Bouton Lake, 9 Apr. 1986, 1 ♂ (USNM).

Discussion.—This species is quite variable throughout its range. The type of *C. albopunctella* agrees with the peninsular Florida specimens (Figs. 5–6). Genitally there is no significant difference between that population and remaining populations over this species range, although Florida specimens usually have a whitish-striated forewing that gives them a distinctive appearance. In the forewing pattern of the Georgia and South Carolina specimens there is a large medial patch of ground color that is outlined with black scales extending from middle of costa to posterior margin of discal cell, with apices truncate to pointed, and a ground color ovate patch outlined in black scales along posterior margin. Some specimens have a wide black horizontal streak from base of forewing to middle of outer margin (Fig. 7). This pattern becomes less distinct in North Carolina. Specimens from Mississippi, Missouri, Texas, and Maryland are practically devoid of pattern, only a remnant postmedial line is present on some specimens. Louisiana specimens can show either a pattern or it can be lacking.

Cutina albopunctella is easily distinguished from the other species by its large size, whitish-striated forewing (peninsular Florida), or its brown forewing dusted with white scales (non-peninsular Florida). *Cutina distincta* differs in the basal fourth of forewing being mixed with black with an adjacent white band. There are 6–9 small spines on the mesotibia (Fig. 4) versus fewer than 4 (Fig. 3) on the other species. The uncus in the male genitalia is diamond shaped. In the female genitalia the sinus vaginalis is rectangular-shaped caudally and the lobes of the 8th sternite are trapezoidal.

Cutina distincta (Grote)
(Figs. 13–18, 31–32, 38, 42)

Eustrotia distincta Grote 1882:184.—Dyar 1902:209.

Erastria distincta Smith 1893:311.

Cutina distincta:—Barnes and Benjamin 1925:198.—Kimball 1965:127.—Franclemont and Todd 1983:127.—Poole 1989:301.

Taseopteryx inquietcolor Dyar 1922:169.—Barnes and Benjamin 1925:198, (junior synonym).—Kimball 1965:127.—Franclemont and Todd 1983:127.—Poole 1989:301.

Diagnosis.—Metanotum black. Tarsi brown with white apical band. Forewing with basal fourth mixed with black scales and an adjacent white band, antemedial line black, postmedial line black. Valve equal width to angulate margins at $\frac{2}{3}$ length. Sinus vaginalis lightly sclerotized, half-circle shaped caudad with caudal margin straight or only slightly concave.

Description.—*Head*: Vertex light brown. Labial palpus light brown speckled with black and white. Antennal scape light brown; scales on flagellum brown, white lateral scale every other segment. *Thorax*: Patagium light brown. Metanotum black; scale tuft present. Tegula a variable mixture of white, brown, and black scales. Venter white. Legs brown and white with white apical tibial band; 4 or fewer spines on mesotibia. Tarsi brown with white apical band. *Forewing* (Figs. 13–18): Male length 9.6–11.8 mm. Female length 10–11.6 mm. Ground color light brown. Basal fourth mixed with black scales and an adjacent white band. Basal line black, indistinct. Antemedial line black. Postmedial line black. Ovate patch absent. Postmedial band mixed with black scales, present as costal subapical and tornal patches. *Hindwing*: Male length 7.6–9.4 mm. Female length 8–9 mm. Ground color light brown. *Abdomen*: Abdomen dorsum a varying mixture of light brown to black scales with a white posterior margin; venter brown. *Male genitalia* (Figs.

31–32): Uncus slender, constant width throughout length. Tegumen without lateral projections. Valve equal width to angulate margins at $\frac{2}{3}$ length; ampulla as wide as base of valve, apex produced; harpe wider at base, angled toward costa at mid-length, narrower than ampulla; costal projection at basal third of valve absent; ampulla as wide as base of valve, apex produced; harpe widest at base, angled toward costa at mid-length, narrower than ampulla; cucullus apex pointed. Apex of aedeagus pointed, with dorsal margin projecting beyond ventral margin into vesica. Vesica with distal diverticula elongate, constricted medially. *Female genitalia* (Fig. 38): Sinus vaginalis lightly sclerotized, half-circle shaped caudad with caudal margin straight or only slightly concave. Lobes of 8th sternite kidney-shaped; lateral margin gently curved forming a wide obtuse angle. Signa long on entire corpus bursae.

Type material.—Holotype ♀, USNM. *Eustrotia distincta* Grote was described from a single specimen (Fig. 17) collected by B. Neunögen, with no specific locality or other data given. It is a heavily marked specimen with narrowed bands, similar to many we have seen from Florida and the Gulf States.

Taseopteryx inquieticolor Dyar was described from two female syntypes in the USNM from "Stemper, Hillsborough County, Florida, September 7 and October 2, 1911 (F. Marloff)." We hereby designate as lectotype the better specimen, taken 2 October 1911 (Fig. 18), and it is so labeled. Both syntypes are normal specimens of *C. distincta*.

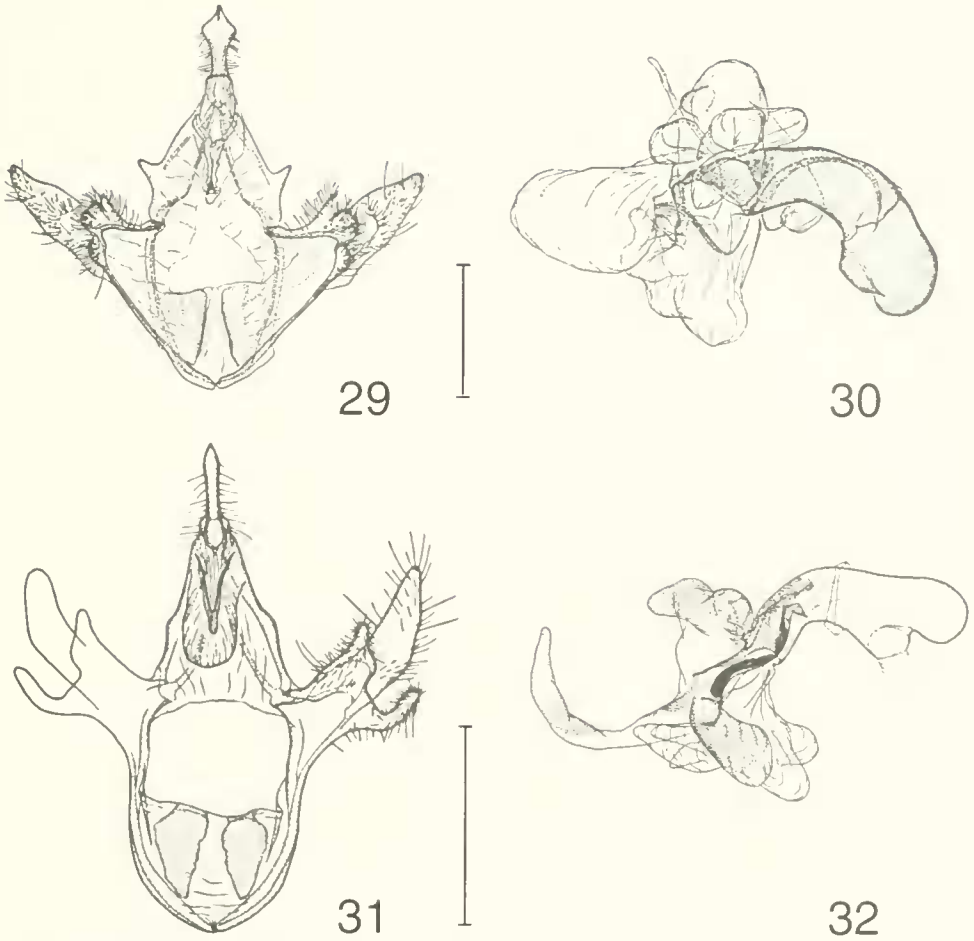
Type locality.—No locality given.

Host.—Cypress (*Taxodium* sp.). A single specimen was reared by R.L. Brown (MSU).

Immature stages.—Unknown.

Flight period.—Records from the end of February and March through September.

Distribution (Fig. 42).—From southwestern and northeastern Florida north along the Atlantic coast to eastern Maryland.



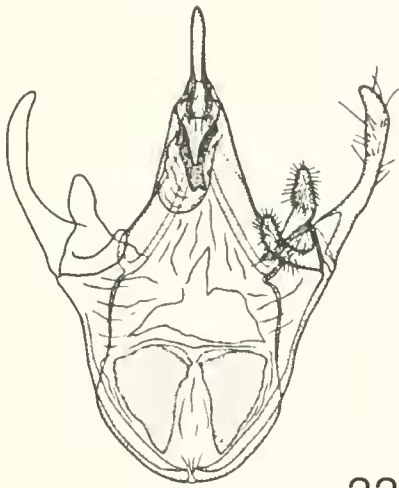
Figs. 29–32. Male genitalia. 29, *Cutina albopunctella*, genitalia. 30, *C. albopunctella*, aedeagus. 31, *C. distincta*, genitalia. 32, *C. distincta*, aedeagus. (All scale lines 1.0 mm.)

Southern Mississippi, Louisiana, southeastern Oklahoma, and eastern Texas north to west central Mississippi, western Kentucky, and northwestern Louisiana.

Material examined.—100 ♂ and 71 ♀. ALABAMA: Baldwin Co., Bon Secour N.W.R., 11–16 May 1994, R.L. Brown & D. Pollock, 1 ♀ (MSU). Monroe Co., Haines Island Park, 28 May 1995, R.L. Brown, 1 ♀ (MSU); Issac Creek Campground, 26–31 May 1995, R.L. Brown, 1 ♂ (MSU). FLORIDA: Charlotte Co., Punta Gorda, 15 May 1953, H. Ramstadt, 1 ♀ (USNM). Collier Co., Collier-Seminole State Park, 2 May 1987, H.D. Baggett, 1 ♂ (USNM); Fakahatchee Strand, Big Cypress

Swamp, 24 Feb. 1985, D.C. Ferguson, 4 ♂, 1 ♀. Fakahatchee Strand Preserve, 3.4 mi NW Copeland, 17 March 1997, M.G. Pogue, 1 ♂ (USNM). Hillsborough Co., Tampa, 14 June 1981, 1 ♀, H.D. Baggett (FSCA); Tampa, USF Golf Crse., 25 Apr. 1982, 1 ♀, H.D. Baggett, bait trail (FSCA). Levy Co., Manatee Sprgs. St. Pk., 5 Apr. 1968, C.V. Covell, Jr., 1 ♂ (ULK). Liberty Co., Torreya State Park, 4 July 1986, H.D. Baggett, 1 ♂ (FSCA). Palm Beach Co., Loxahatchee, Flying Cow Ranch, 21 Apr. 1962, 1 ♂, 1 ♀ (USNM). Putnam Co., Palatka, 6 May 1990, H.D. Baggett, 1 ♀ (USNM); Univ. of Florida Preserve, Welaka, 21 Mar. 1987, 4 ♂, 22 Mar. 1987, 7 ♂, 24 Mar. 1987, 1 ♀.

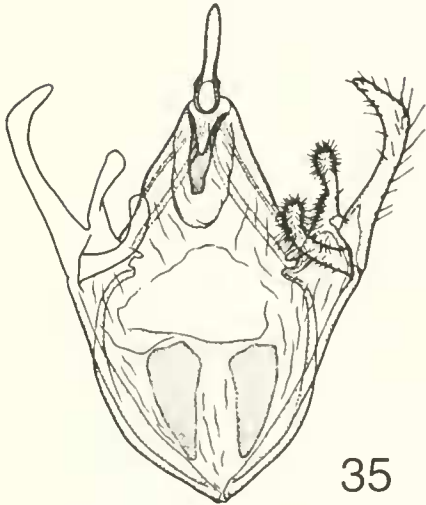
- 25 Mar. 1987, 3 ♂, 1 ♀, 26 Mar. 1987, 5 ♂, D.C. Ferguson (USNM); Weems Property, Red Water Lake, 29 July 1967, H.V. Weems, Jr. 1 ♀ (USNM), St. Johns Co., Hastings, 1 ♀ (USNM). Volusia Co., De Land, 1–15 Mar. 1953, H. Ramstadt, 1 ♀ (USNM). GEORGIA: Charlton Co., Boardwalk trail, Okefenokee Swamp, nr. Folkston, 26 Mar. 1990, 2 ♂, 1 ♀, 28 Mar. 1990, 2 ♂, D.C. Ferguson (USNM); Boardwalk trail, Chesser Is., Okefenokee Natl. Wildlife Refuge, 18 Apr. 1991, D.C. Ferguson, 1 ♂ (USNM); Okefenokee Swamp, nr. Stephen Foster State Pk., 5 May 1981, D.C. Ferguson, 1 ♀ (USNM). KENTUCKY: Fulton Co., Rt. 94, 2.5 mi E Cayce, 8 Sep. 1984, C.V. Covell, Jr., 1 ♀ (ULK). LOUISIANA: Bossier Par., Bodcau W.M.A., 20 May 1996, D. Adamski, blacklight in calcareous forest, William H. Cross Expedition, 1 ♀ (USNM); Barksdale A.F.B., 10 Apr. 1996, 1 ♂, 11 Apr. 1996, D. Pollock, 2 ♂, (MSU). Calcasieu Par., near Lake Charles, 3 Sep. 1961, J.R. Heitzman, light in swamp, 1 ♂ (USNM); S.H. Jones State Park, 19–23 May 1993, R.L. Brown & D. Pollock, 2 ♂, (MSU). St. Charles Par., Bonnet Carre Spillway, 24 July 1971, 1 ♀, E.H. Metzler (EHM). St. John the Baptist Par., Edgard, 10 Apr. 1984, 1 ♀, 16 May 1981, 1 ♀, 20 May 1982, 1 ♂, 23 May 1982, 1 ♂, 24 May 1981, 1 ♀, 25 May 1976, 1 ♂, 26 Sep. 1980, 1 ♂, V.A. Brou, UV light trap, (VAB). St. Tammany Par., 4.2 mi NE Abita Springs, sec. 24, T6S, R12E, 26 Mar. 1984, 1 ♀, 1 May 1983, 1 ♂, 13 May 1984, 1 ♀, 30 July 1983, 1 ♀, 30 Aug. 1983, 1 ♀, V.A. Brou (VAB). MARYLAND: Wicomico Co., Vienna, 10 Sep. 1988, J. Glaser, 1 ♀ (JG). Worcester Co., Pocomoke St. For., 30 July 1990, 1 ♂, 2 ♀, 16 July 1993, 1 ♂, 1 ♀, J. Glaser (JG); Shad Landing, 24 July 1989, 1 ♂, 30 July 1990, 1 ♀, J. Glaser (JG); Nassawango Preserve, 24 July 1989, J. Glaser, 1 ♂ (JG); 7 mi N. Pocomoke, Blades Rd., 16 June 1997, 1 ♂ (JG). MISSISSIPPI: Bolivar Co., 4.2 mi WSW Scott, 23 June 1993, D.M. Pollock, 3 ♂ (MSU). Franklin Co., 2 mi W Quentin, 19 Aug. 1982, R.L. Brown, 1 ♀ (MSU). George Co., Mixon Lakes, 12 Apr. 1996, R.L. Brown, 1 ♀ (MSU); Pascagoula Rvr. W.M.A., 9 Apr. 1994, R.L. Brown & D. Pollock, 2 ♀ (MSU). Hancock Co., M.T.F., 24 Apr. 1992, 1 ♀, 3 May 1992, 1 ♂, 15 May 1992, 1 ♂, 19 May 1992, 1 ♂, 26 May 1977, 1 ♀, 21 June 1992, 1 ♀, 25 June 1992, 1 ♂, 13 Sep. 1992, 1 ♂, R. Kergosien (BM); St. Louis Bay, 30 July 1979, 1 ♂, 1 Aug. 1979, R. Kergosien, 1 ♀ (BM). Harrison Co., Lizana, 30 June 1991, R. Kergosien, 1 ♀ (BM); Long Beach, 21 May 1992, R. Kergosien, 1 ♂ (BM); Pass Christian, 1 June 1979, R. Kergosien, 1 ♀ (BM). Jackson Co., MS Sandhill Crane N.W.R., 7 Sep. 1994, J.A. MacGown, 1 ♀ (MSU). Noxubee Co., Noxubee Wild. Ref., 14 Apr. 1993, D.M. Pollock, 1 ♂ (MSU). Oktibbeha Co., 6 mi SW Starkville, 25 Apr. 1985, 1 ♂, 17 Aug. 1974, 1 ♀, R.L. & B.B. Brown, (MSU); T18W R14E Sec. 23, 19 Apr. 1992, 1 ♀, 28 May 1991, 1 ♀, 6 June 1987, 2 ♀, 7 Aug. 1987, 1 ♂, 11 Aug. 1987, 1 ♀, R.L. & B.B. Brown (MSU). Sharkey Co., Delta Nat. For., 18 Aug. 1993, D.M. Pollock, 1 ♀ (MSU). Stone Co., Red River Mgt. Area, 11 May 1981, R.L. Brown, 1 ♂ (MSU). Tishomingo Co., Tish. St. Pk., 11 Apr. 1986, 1 ♂, 11–12 Apr. 1986, 1 ♂, 15 Apr. 1988, R.L. Brown, 1 ♂ (MSU). Washington Co., Greenville, Aug. 1909, Geo. Dörner, 1 ♂ (USNM). OKLAHOMA: McCurtain Co., Broken Bow, 13 June 1939, Kaiser-Nailon, 1 ♂ (USNM); Eagletown, 12 June 1939, Kaiser-Nailon, 1 ♂, 1 ♀ (USNM). NORTH CAROLINA: Brunswick Co., Greenbank Bluff, 11 Sep. 1995, 1 ♂, 18 Sep. 1995, 1 ♀, J. Bolling Sullivan, coastal plain marl outcrop, 15 W UV trap (USNM); Leland, 26 June 1939, Otto Buchholz, 1 ♀ (AMNH); Jct. St. Hwy. 101 & 181, 27 June 1977, J. Bolling Sullivan, 1 ♀ (USNM); Walker Mill Pond, 29 Apr. 1990, J. Bolling Sullivan, 1 ♂ (USNM). Craven Co., North Harlowe, 23 May 1990, 1 ♂, 27 May 1990, 1 ♀, 7 June 1990, 1 ♀, 13 June 1990, 1 ♀, 26 June 1990, 1 ♂, 8 Aug. 1990, 1 ♂, 17 Aug. 1990, 1 ♂, 29 Aug. 1990, 2 ♂, 2 Sep.



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Figs. 33–36. Male genitalia. 33, *Cutma aluticolor*, genitalia. 34, *C. aluticolor*, aedeagus. 35, *C. arcuata*, genitalia. 36, *C. arcuata*, aedeagus. (All scale lines 1.0 mm.)

1990, 1 ♂, J. Bolling Sullivan (USNM); Pinecliff, 23 June 1978, 1 ♀, 24 July 1978, 1 ♀, J. Bolling Sullivan, (USNM). SOUTH CAROLINA: Charleston Co., McClellanville, 19 Apr. 1971, 1 ♀, 1 June 1968, 1 ♂, 15 June 1972, 1 ♀, genitalia slide USNM 57206 [green label], 26 June 1971, 1 ♀, 29 July 1971, 1 ♀, R.B. Dominick, Charles R. Edwards, (USNM); Wedge Plantation, McClellanville, 21 Apr. 1974, 1 ♂, 25 Apr. 1980, 1 ♀, 6 June 1978, 1 ♀, D.C. Ferguson (USNM); Wedge Plantation, McClellanville, South Santee River,

27 Mar. 1967, 1 ♂, genitalia slide USNM 56586 [green label], 28 Mar. 1967, 1 ♂, 29 Mar. 1967, 6 ♂, 31 Mar. 1967, 1 ♂, genitalia slide USNM 56573 [green label], 12 July 1967, 1 ♂, 15 July 1967, 1 ♂, genitalia slide USNM 56585 [green label], 20 July 1967, 1 ♂, 27 July 1967, 1 ♀, 1 Aug. 1967, 1 ♂, 17 Aug. 1967, 1 ♂, 18 Aug. 1967, 1 ♀, D.C. Ferguson (USNM). TEXAS: Harrison Co., Caddo Lake St. P., 29 Aug. 1985, E.C. Knudson, 1 ♀ (USNM). Jasper Co., Martin Dies St. Pk., 29 June 1986, 1 ♀, 17 Aug. 1985, 1 ♀, E.C. Knudson (USNM).

Montgomery Co., Camp Strake, 7 Sep. 1977, 1 ♀, 14 Sep. 1977, 1 ♀, A. & M.E. Blanchard (USNM). Tyler Co., Town Bluff Dam B, 3 Mar. 1967, 1 ♂, genitalia slide A.B. 4565 [green label], 7 Aug. 1975, 1 ♂, A. & M.E. Blanchard (USNM). VIRGINIA: Chesapeake Co., Seashore St. Pk., 1–4 June 1975, D. & M. Davis, 3 ♂ (USNM); Seashore State Park, Cape Henry, 10 June 1974, Don & Mignon Davis, 1 ♀ (USNM). Nansemond Co., L. Drummond, Dismal Swamp, 8–9 June 1974, D. & M. Davis, 1 ♀, 6–7 July 1962, 1 ♂, D.R. Davis (USNM).

Discussion.—The dark brown basal band and apical and tornal patches distinguishes this species. Specimens from Texas tend to lose this basal band, but have a distinct black antemedial line.

***Cutina aluticolor* Pogue and Ferguson,
new species**

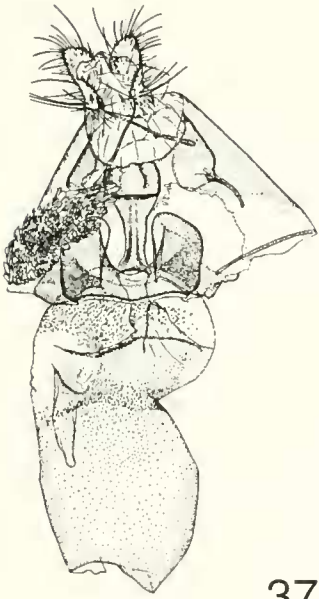
(Figs. 1–3, 19–22, 33–34, 39, 43)

Diagnosis.—Forewing ground color light brown, basal line absent, postmedial band black, reduced to a tornal patch. Valve narrow, margins curved. Lobes of 8th sternite kidney-shaped; lateral margin gently curved, forming a wide obtuse angle.

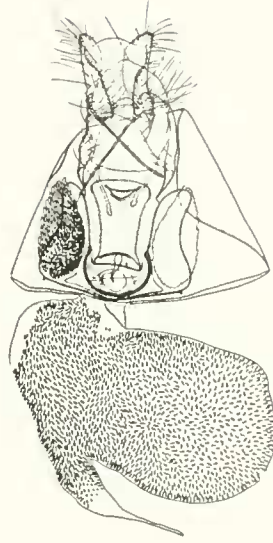
Description.—*Head*: Vertex light brown. Labial palpus light brown speckled with black and white. Antennal scape light brown; scales on flagellum brown, white laterally. *Thorax*: Patagium light brown. Metanotum light brown; scale tuft absent. Tegula light brown. Venter white. Legs brown and white with white apical tibial band; 4 or fewer spines on mesotibia. Tarsi light brown with white apical band. *Forewing* (Figs. 19–22): Male length 9.8–11.2 mm. Female length 9–11.2 mm. Ground color light brown. Basal line absent. Antemedial line absent. Postmedial line black, with white scales highlighting apical fourth. Ovate patch absent. Postmedial band black, reduced to a tornal patch. *Hindwing*: Male length 7.8–8.8 mm. Female length 7–9 mm. Ground color light brown. *Abdomen*: Dorsum light brown; venter light brown. *Male*

genitalia (Figs. 33–34): Uncus slender, constant width throughout length. Tegumen without lateral projections. Valve narrow, margins curved; costal projection at basal third of valve absent; ampulla equal width throughout length; harpe equal width throughout length, similar to ampulla; cucullus apex pointed. Apex of aedeagus, truncate, with dorsal and ventral margins equal. Vesica with distal diverticula elongate, constricted medially. *Female genitalia* (Fig. 39): Sinus vaginalis lightly sclerotized, crescent-shaped caudad with caudal margin concave. Lobes of 8th sternite kidney-shaped; lateral margin gently curved, forming a wide obtuse angle. Signa long on entire corpus bursae.

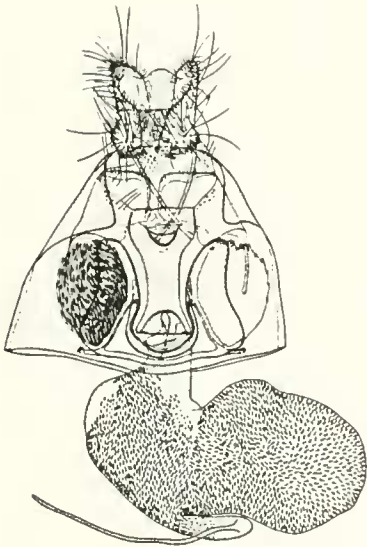
Type material.—Holotype ♂ with following 4 labels: "Univ. of Florida Preserve, Welaka, Putnam Co., Fla. March 22, 1987/ D.C. Ferguson, Collector/USNM ENT 00059550 [bar code label]/HOLOTYPE USNM 105501, *Cutina aluticolor*, Pogue and Ferguson [Red label]." Deposited in the USNM. Paratypes: 148 ♂, 140 ♀. FLORIDA: Flagler Co., Crescent Lake, Shell Bluff Landing, 5 Apr. 1989, H.D. Baggett, 1 ♀ (USNM). Hillsborough Co., Tampa, 22 Apr. 1982, 1 ♀, 28 Apr. 1984, 1 ♀, 14 June 1981, 1 ♂, 1 ♀, H.D. Baggett (USNM); Tampa, USF Golf Crse., 4 May 1981, 1 ♀, 9 June 1981, 2 ♀, H.D. Baggett, bait trail (FSCA). Liberty Co., Torreya State Park, 21 May 1982, 1 ♀, 4 July 1986, 1 ♀, H.D. Baggett, (USNM). Putnam Co., 2 mi SW Satsuma, 18 June 1968, J.A. Concello, 1 ♂, 1 ♀, ♀ genitalia slide USNM 56577 [green label]; Palatka, 8 Feb. 1989, 1 ♂, 24 May 1990, 1 ♂, H.D. Baggett (USNM); Univ. of Florida Preserve, Welaka, 21 Mar. 1987, 9 ♂, 1 ♀, ♂ genitalia slide USNM 57207 [green label], 22 Mar. 1987, 7 ♂, 1 ♀, 23 Mar. 1987, 2 ♂, 25 Mar. 1987, 5 ♂, 7 ♀, ♂ genitalia slide USNM 57208, ♀ genitalia slide USNM 57209 [green labels], 26 Mar. 1987, 14 ♂, 2 ♀, 19 Sep. 1987, 1 ♀ (USNM). INDIANA: Posey Co., Gray Estates, 30 June 1995, Enz & Covell, 1 ♀ (ULK); Goose Pond Sl., 22



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Figs. 37-40. Female genitalia. 37, *Cutina albopunctella*. 38, *C. distincta*. 39, *C. aluticolor*. 40, *C. arcuata*. (All scale lines 1.0 mm.)

Aug. 1995, 1 ♀, 30 June 1995, 4 ♂, Enz & Covell (ULK); Twin Swamps, 30 June 1995, 1 ♀, 22 Aug. 1995, 2 ♂, 2 ♀, Enz & Covell (ULK). LOUISIANA: Ascencion

Par., Prairieville, 24 Mar. 1978, 1 ♀, 15 Apr. 1978, 1 ♀, Vernon A. Brou (VAB). Bossier Par., Barksdale A.F.B., 11 Apr. 1996, 1 ♂, 11 July 1996, 1 ♀, D.M. Pol-

lock, (MSU). Calcasieu Par., S.H. Jones St. Pk., 19–23 May 1993, R.L. Brown & D.M. Pollock, 15 ♂, 31 ♀, J.A. McGown, 2 ♂, 1 ♀, 20–21 May 1993, R.L. Brown & D.M. Pollock, 1 ♀ (MSU). St. Charles Par., Hahnville, 3 July 1978, V.A. Brou, 1 ♀ (VAB). St. John the Baptist Par., Edgard, 13 Mar. 1980, 1 ♀, 6 May 1983, 1 ♂, 20 May 1981, 1 ♂, 26 June 1982, 1 ♀, 15 Aug. 1983, 1 ♂, 18 Aug. 1983, 1 ♂, V.A. Brou, UV light trap (VAB). MISSISSIPPI: Bolivar Co., 4.2 mi WSW Scott, 23 June 1993, D.M. Pollock, 1 ♀ (MSU). George Co., Mixon Lakes, 8–9 Apr. 1994, 1 ♂, R.L. Brown & D. Pollock, 12 Apr. 1996, R.L. Brown, 2 ♀ (MSU). Hancock Co., M.T.F., 13 Mar. 1992, 2 ♂, 28 Mar. 1992, 2 ♂, 1 ♀, 25 May 1992, 1 ♂, 28 May 1977, 1 ♂, 21 June 1992, 1 ♂, 18 July 1992, 1 ♀, 9 Aug. 1991, 7 ♂, 13 ♀, 13 Sep. 1991, 1 ♂, R. Kergosien, (BM); 2 mi N Pearlinton, T9S, R16W, Sec. 6, 23 July 1989, T.L. Schiefer, 1 ♀ (MSU). Pearl River Co., 3 mi east Bogalusa, 17 Aug. 1991, R. Kergosien, 2 ♂, 1 ♀ (BM). Noxubee Co., Noxubee N.W. Refuge, 14 Apr. 1993, D.M. Pollock, 2 ♂, 3 ♀ (MSU). Oktibbeha Co., 6 mi W. Starkville, 15 Apr. 1986, R.L. & B.B. Brown, 1 ♂ (MSU). Tishomingo Co., Tish. St. Pk., 11 Apr. 1986, R.L. Brown, 1 ♂ (MSU). MISSOURI: Stoddard Co., Otter Slough Wildlife Area, 25 Aug. 1983, J.R. Heitzman, Cypress-Tupelo Swamp with associated southeastern forest, coll. at blacklight 1 ♂, 2 ♀ (JRH). Wayne Co., Markham Springs Nat. For. Cmpg., 7 June 1984, 2 ♂, 21 July 1984, 1 ♂, 2 ♀, J.R. Heitzman, Cane, Cypress, Tupelo, pine & deciduous forest, coll. at blacklight (JRH). NORTH CAROLINA: Brunswick Co., Greenbank Bluff, 11 Sep. 1995, J. Bolling Sullivan, CP marl outcrop, 1 ♂ (USNM). Carteret Co., Walker Mill Pond, 30 May 1990, J. Bolling Sullivan, 1 ♂ (USNM); Pinecliff, 26 July 1978, J. Bolling Sullivan, 3 ♀ (USNM). Craven Co., North Harlowe, 20 Mar. 1990, 2 ♂, 1 ♀, 28 Mar. 1990, 2 ♂, 31 Mar. 1990, 3 ♂, 21 Apr. 1990, 1 ♂, 21 Apr. 1991, 3 ♂, 1 ♀, 25 Apr. 1990, 1 ♂, 2 ♀, 28 Apr. 1990, 1

♂, 1 ♀, 1 May 1990, 1 ♂, 9 May 1990, 1 ♀, 13 May 1990, 1 ♂, 26 May 1990, 1 ♀, 3 June 1990, 4 ♂, 1 ♀, 7 June 1990, 1 ♂, 8 June 1990, 2 ♀, 13 June 1990, 3 ♀, 15 June 1990, 2 ♂, 5 ♀, 21 June 1990, 1 ♂, 1 ♀, 23 June 1990, 2 ♀, 30 June 1990, 1 ♀, 14 July 1990, 2 ♀, 18 July 1990, 1 ♀, 21 July 1990, 4 ♀, 31 July 1990, 3 ♀, 10 Aug. 1990, 1 ♀, 14 Aug. 1990, 1 ♀, 15 Aug. 1990, 1 ♀, 17 Aug. 1990, 2 ♂, 18 Aug. 1990, 1 ♂, 21 Aug. 1990, 2 ♂, 2 ♀, 29 Aug. 1990, 2 ♀, 2 Sep. 1990, 2 ♂, J. Bolling Sullivan (USNM); Pinecliff, 23 June 1978, 1 ♀, 13 July 1978, 1 ♂, 12 Aug. 1978, 3 ♀, J. Bolling Sullivan (USNM). New Hanover Co., Smith Creek, Wilmington, 30 Apr. 1994, 1 ♂, 15 June 1990, 1 ♂, 17 June 1990, 1 ♂, 22 June 1990, 1 ♂, 18 July 1994, 2 ♂, 24 July 1990, 3 ♂, 17 Aug. 1990, 2 ♂, 28 Aug. 1990, 2 ♂, 2 ♀, J. Bolling Sullivan, Richard Broadwell, & Brad Smith (USNM). Pender Co., Holly Shelter Gamelands, 18 July 1995, J. Bolling Sullivan, 1 ♂ (USNM). SOUTH CAROLINA: Charleston Co., McClellanville, 13 July 1970, R.B. Dominick, Charles R. Edwards, 1 ♂ (USNM); Wedge Plantation, South Santee River, 27 Mar. 1967, 1 ♂, 29 Mar. 1967, 2 ♂, 2 ♂ genitalia slides USNM 56583, 56575 [green labels], 31 Mar. 1967, 1 ♂, D.C. Ferguson (USNM); TEXAS: Jasper Co., Martin Dies St. Pk., 29 June 1986, E.C. Knudson, 2 ♂ (USNM). VIRGINIA: Nansemond Co., L. Drummond, Dismal Swamp, 6–7 July 1962, O.S. Flint, Jr., 1 ♂ (USNM).

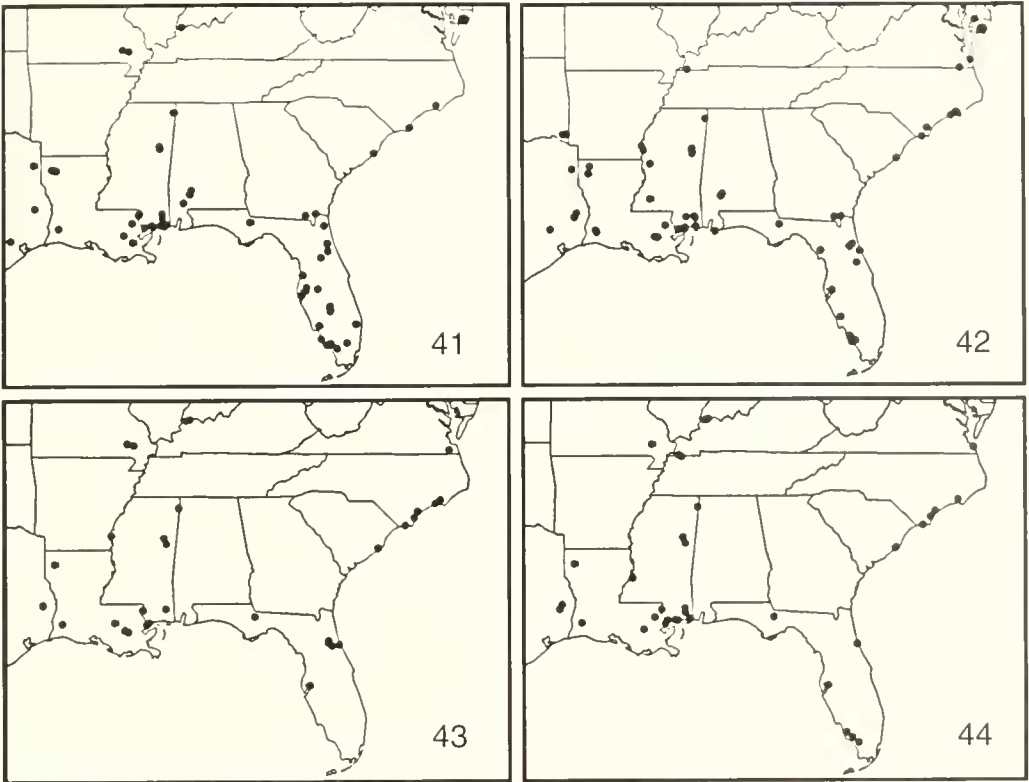
Host.—Unknown, probably Cypress (*Taxodium* sp.).

Immature stages.—Unknown.

Flight period.—Records from mid-February and March through September.

Distribution (Fig. 43).—From west central to northeastern Florida, South Carolina, and North Carolina. Mississippi, Louisiana, eastern Texas, north to southeastern Missouri and southwestern Indiana.

Discussion.—Specimens from Florida tend to have a lighter ground color, more distinct pattern, and a ternal patch. Speci-



Figs. 41–44. *Cutina* distribution. 41, *C. albopunctella*. 42, *C. distincta*. 43, *C. aluticolor*. 44, *C. arcuata*.

mens from outside Florida are darker, with a less distinct pattern and no tornal patch. The best character to distinguish *C. aluticolor* is the white highlighting at the apex of the postmedial line.

Etymology.—The specific name refers to the Latin terms *aluta* meaning leather and *color*, referring to the brown leather-colored forewing ground color.

***Cutina arcuata* Pogue and Ferguson,
new species**

(Figs. 23–28, 35–36, 40, 44)

Diagnosis.—Forewing ground color brown, basal line black, indistinct, antemedial line white and black. Postmedial line black and white, produced subapically, postmedial band irregular, mostly black mixed with brown and white. Valve narrow, margins abruptly angulate at $\frac{2}{3}$ length. Lobes of 8th sternite kidney-shaped; lateral

margin abruptly curved forming a narrow obtuse angle.

Description.—**Head:** Vertex a mixture of white and light brown. Labial palpus light brown speckled with black and white. Antennal scape white and brown; scales on flagellum brown, white laterally. **Thorax:** Patagium light brown. Metanotum brown with some white scales; scale tuft present. Tegula a variable mixture of white, brown, and black scales. Venter white. Legs brown and white with white apical tibial band; 4 or fewer spines on mesotibia. Tarsi light brown with white apical band. **Forewing** (Figs. 23–28): Male length 9.4–10.6 mm. Female length 9.6–10.6 mm. Ground color brown. Basal line black, indistinct. Antemedial line white and black. Postmedial line black and white, produced subapically. Ovate patch absent. Postmedial band irregular, mostly black mixed with brown and

white. *Hindwing*: Male length 7.2–8.2 mm. Female length 7.6–8.2 mm. Ground color light brown. *Abdomen*: Dorsum a mixture of brown and black scales with a white posterior margin; venter brown. *Male genitalia* (Figs. 35–36): Uncus slender, constant width throughout length. Tegumen without lateral projections. Valve narrow, margins abruptly angulate at $\frac{2}{3}$ length; costal projection at basal third of valve absent; ampulla equal width throughout length; harpe equal width throughout length, similar to ampulla; cucullus pointed. Apex of aedoeagus, truncate, with dorsal and ventral margins equal. Vesica with distal diverticula, tapered from base to apex. *Female genitalia* (Fig. 40): Sinus vaginalis lightly sclerotized, crescent-shaped caudad with caudal margin concave. Lobes of 8th sternite kidney-shaped; lateral margin abruptly curved forming a narrow obtuse angle. Signa long on entire corpus bursae.

Type material.—Holotype ♂ with following 3 labels: "Wedge Plantation, South Santee River, Charleston Co., S.C. March 28, 1967 Douglas C. Ferguson/USNM ENT 00059837 [bar code label]/HOLOTYPE USNM 105502, *Cutina arcuata*, Pogue and Ferguson [Red label]." Deposited in the USNM. Paratypes: 157 ♂, 76 ♀. FLORIDA: Collier Co., Big Cypress Swamp Natl. Pres., 5 mi S of US Hwy 41, 20 March 1997, M.G. Pogue, 1 ♂, 2 ♀ (USNM); Fakahatchee Strand, Big Cypress Swamp, 24 Feb. 1985, D.C. Ferguson, 15 ♂, 2 ♂ genitalia slides USNM 56803, 57202 [green labels] (USNM); Fakahatchee Strand Preserve, 3.4 mi NW of Copeland, 17 March 1997, M.G. Pogue, 1 ♂, 1 ♀ (USNM). Lee Co., Six Mile Cypress Slough, 15 Mar. 1997, M.G. Pogue, 1 ♂, 3 ♀ (USNM). Hillsborough Co., Tampa, 22 Apr. 1982, 1 ♀, 14 June 1981, 1 ♀, H.D. Baggett, (FSCA); Tampa, USF Golf Crse., 4 May 1981, 1 ♀, 9 June 1981, 1 ♀, bait trail, H.D. Baggett (FSCA). Liberty Co., Torreya State Park, 20 June 1987, T.L. Schiefer, 1 ♀ (MSU). Putnam Co., Univ. Of Florida Preserve, Welaka, 21 Mar. 1987, 2 ♂, 22 Mar.

1987, 2 ♂, 2 ♀, ♂ genitalia slide USNM 57204 [green label], 2 ♀, 25 Mar. 1987, 9 ♂, 6 ♀, 26 Mar. 1987, 13 ♂, D.C. Ferguson (USNM); University Reserve, Welaka, 7 Apr. 1972, 1 ♀, D.C. Ferguson (USNM); University Conservation Reserve, Welaka, 23 Mar. 1987, D.C. Ferguson, 5 ♂, 1 ♀ (USNM). INDIANA: Posey Co., Goose Pond Sl., 30 June 1995, 5 ♂, 2 ♀, 22 Aug. 1995, 5 ♂, 1 ♀, Enz & Covell (ULK); Twin Swamps, 22 Aug. 1995, 4 ♂, 2 ♀, 1 Oct. 1995, 1 ♂, Enz & Covell. KENTUCKY: Fulton Co., Reelfoot Wife. Area, 12 May 1984, C.V. Covell, Jr., 2 ♂ (USNM); Rt. 94, 2.5 mi E Cayce, 3 Aug. 1986, C.V. Covell, Jr., 1 ♀ (USNM). LOUISIANA: Bossier Par., Barksdale A.F.B., 17 Apr. 1996, 1 ♂, 24 Aug. 1994, 1 ♂, D.M. Pollock (MSU). Calcasieu Par., S.H. Jones St. Pk., 19–23 May 1993, R.L. Brown & D.M. Pollock, 18 ♂, 6 ♀ (MSU). St. John the Baptist Par., Edgard, 9 May 1979, 1 ♂, 9 June 1983, 1 ♀, 24 July 1977, 1 ♂, V.A. Brou (VAB). St. Charles Par., Bonnet Carre Spillway, 9 Aug. 1971, 3 ♀, E.H. Metzler (EHM). St. Tammany Par., 4.2 mi NE Abita Springs, sec. 24, T6S, R12E, 13 Apr. 1984, V.A. Brou, 1 ♂ (VAB). MISSISSIPPI: Bolivar Co., 4.2 mi WSW Scott, 12–13 May 1993, D.M. Pollock, 1 ♂ (MSU). Claiborne Co., 3.6 mi W Port Gibson, 12 July 1993, D.M. Pollock, 2 ♀ (MSU). George Co., Mixon Lakes, 12 Apr. 1996, R.L. Brown, 1 ♂ (MSU). Hancock Co., Diamondhead, 5 Apr. 1991, R. Kergosien, 1 ♀ (BM); M.T.F., 17 Mar. 1992, 1 ♂, 19 Mar. 1992, 1 ♂, 1 ♀, 28 Mar. 1992, 1 ♂, 7 Apr. 1992, 1 ♀, 15 Apr. 1992, 1 ♂, 15 May 1992, 1 ♂, 19 May 1992, 1 ♂, 29 June 1973, 1 ♂, 11 July 1992, 1 ♀, 18 July 1992, 1 ♀, 9 Aug. 1991, 3 ♂, 5 ♀, R. Kergosien (BM); 2 mi N Pearlinton, T9S, R16W, Sec. 6, 23 July 1989, T.L. Schiefer, 2 ♂ (MSU). Harrison Co., Hansboro, 7 Apr. 1967, Bryant Mather, 1 ♂ (BM); I-10 exit 24, 6 Apr. 1992, R. Kergosien, 1 ♂ (BM); Lizana, 29 June 1991, R. Kergosien, 1 ♂ (BM). Jackson, Co., Blk. Cr., nr. George-Jacoline, 1 Aug. 1991, R. Kergosien, 1 ♂ (BM); I-10 at Escatawpa

River, 13 Apr. 1991, R.L. Brown, 1 ♂, 1 ♀ (MSU). Noxubee Co., Noxubee N.W. Refuge, 14 Apr. 1993, D.M. Pollock, 11 ♂ (MSU). Oktibbeha Co., 6 mi SW Starkville, 21 July 1986, R.L. & B.B. Brown, 2 ♀ (MSU). Pearl River Co., 3 mi east Bogalusa, 17 Aug. 1991, R. Kergosien, 2 ♂ (BM). Tishomingo Co., Tish. St. Pk., 11 Apr. 1986, R.L. Brown, 1 ♀, 11–12 Apr. 1986, J.R. MacDonald, 1 ♂ (MSU). MISSOURI: Stoddard Co., Otter Slough Wildlife Area, 4 July 1982, 1 ♀, 25 Aug. 1983, 1 ♂, 1 ♀, J.R. Heitzman (JRH). NORTH CAROLINA: Brunswick Co., Greenbank Bluff, 16 Apr. 1995, 2 ♂, 28 Aug. 1995, 1 ♂, J. Bolling Sullivan, coastal plain marl outcrop (USNM). Craven Co., North Harlowe, 28 Mar. 1990, 1 ♂, 13 Apr. 1990, 1 ♂, 3 June 1990, 1 ♂, 21 Aug. 1990, 1 ♀, J. Bolling Sullivan (USNM); Pinecliff, 23 June 1978, J. Bolling Sullivan, 1 ♂ (USNM). New Hanover Co., Smith Creek, Wilmington, 15 June 1994, 1 ♂, 18 June 1994, 1 ♂, 17 July 1994, 2 ♂, 3 ♀, 31 July 1994, 1 ♂, J. Bolling Sullivan, Richard Broadwell, & Brad Smith (USNM). Pender Co., Holly Shelter gamelands, 23 May 1995, 1 ♂, cypress-gum swamp on Cape Fear, 18 July 1995, 1 ♂, swamp hardwoods, J. Bolling Sullivan, 15 W UV trap (USNM). SOUTH CAROLINA: Charleston Co., Wedge Plantation, McClellanville, 21 Apr. 1974, 1 ♂, 1 ♀, ♂ genitalia slide USNM 56587 [green label], 1 ♀, 4 June 1978, 1 ♀, 5 June 1978, 1 ♀, D.C. Ferguson (USNM); Wedge Plantation, South Santee River, 27 Mar. 1967, 2 ♂, 28 Mar. 1967, 5 ♂, 29 Mar. 1967, 5 ♂, 2 ♀, 31 Mar. 1967, 2 ♂, 5 Aug. 1968, 1 ♀, D.C. Ferguson (USNM); Wedge Plantation, South Santee River, 12 July 1967, 1 ♀, 2 Aug. 1967, 1 ♀, 3 Aug. 1967, 1 ♀, 23 Aug. 1967, 1 ♂, James W. Porter (USNM). Dorchester Co., Saint George, 23 June 1996, V.S.A. Albu, 1 ♀ (VSA). TEXAS: Jasper Co., Martin Dies St. Pk., 29 June 1986, E.C. Knudson, 3 ♀ (USNM). Tyler Co., Town Bluff Dam B, 7 Aug. 1975, A. & M.E. Blanchard, ♂ genitalia slide A.B.

4566 (USNM). VIRGINIA: Chesapeake Co., Seashore St. Pk., 1–4 June 1975, D. & M. Davis, 4 ♂, 1 ♀ (USNM).

Host.—Unknown, probably cypress (*Taxodium* sp.). The series from the type locality was collected in a trap in a small, isolated stand of cypress on the University of Florida Conservation Reserve. None were taken at other sites in the Reserve where cypress was absent.

Immature stages.—Unknown.

Flight period.—Records from the end of February and March through August.

Distribution (Fig. 44).—From southwest and northeast Florida and eastern South Carolina, North Carolina, and southeastern Virginia. Mississippi, Louisiana, and eastern Texas, north to southeastern Missouri, and southwestern Kentucky and Indiana.

Discussion.—Specimens from peninsular Florida have gray scales in the postmedial area of the forewing resulting in a pale apical area and longitudinal streaks (Figs. 26–28). Also, this Florida form tends to have a narrower median space, i.e. the antemedian and postmedial lines are closer together than in specimens from elsewhere. The male genitalia is most similar to that of *Cutina aluticolor*, but valve has an abrupt angle at $\frac{2}{3}$ its length.

Etymology.—The specific name refers to the produced postmedial line and is Latin.

PHYLOGENY

A phylogenetic analysis was undertaken to determine the relationships between the species of *Cutina*. *Cutina* is monophyletic based on the following synapomorphies: 1) 8th sternite of the female with kidney-shaped lobes and 2) associated scale patches dorsad to lobes.

Character coding.—Outgroup comparison was used to determine polarity of binary characters, the outgroup having the plesiomorphic character state. Multistate characters were polarized using Morphocline Analysis (Maslin 1952).

Methods.—Hennig86 (Farris 1988) analyzed the data and constructed trees using

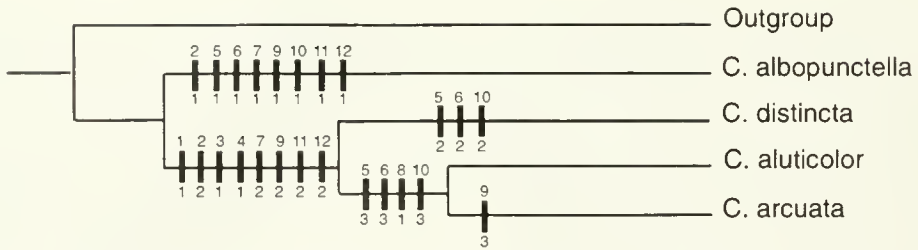


Fig. 45. Cladogram of the species of *Cutina*. Synapomorphies refer to solid black rectangles. Character numbers are on top and state numbers are on bottom of rectangles.

the most parsimonious Wagner trees method. The implicit enumeration command (ie*), plus branch swapping (bb*), was used to generate the trees. This command uses an exact algorithm and retains all trees produced resulting in the most parsimonious trees.

Outgroup.—*Focillidia* was used as the outgroup as it shares the same angulate outer margin of the forewing with *Cutina*. The uncus shape in *Focillidia* is similar to the diamond-shaped apex in *C. albopunctella*; as are the lateral projections on the tegumen, only smaller. *Focillidia* includes 3 species, *F. texana* Hampson, a southern species that occurs in Florida, Texas, and Arizona; *F. grenadensis* Hampson, an Antillean species; and *F. bipunctata* (Walker) a Central and South American species. *F. texana* and *bipunctata* were sampled for characters used in the phylogenetic analysis.

CHARACTERS

Characters of the male and female genitalia were used almost exclusively, as these show the best relationships between taxa. Twelve characters were used, 3 binary and 9 multistate; derived from 8 ♂, 3 ♀, and 1 leg character. The character matrix is shown in Table 1.

Leg.—*Character 1.* Number of spines on mesotibia: 0) 6–9 (Fig. 4), 1) 4 or fewer (Fig. 3).

Male genitalia.—*Character 2.* Uncus shape: 0) wide, diamond-shaped, 1) subapical diamond-shaped expansion (Fig. 29);

2) slender, constant width throughout length (Figs. 31, 33, 35). *Character 3.* Lateral projections on tegumen: 0) present; 1) absent; (Fig. 29). *Character 4.* Costal projection of valve: 0) present at basal third, 1) absent at basal third (Fig. 29). *Character 5.* Ampulla shape: 0) elongate, truncate projection; 1) a swollen knob (Fig. 29); 2) as wide as base of valve, apex produced (Fig. 31); 3) equal width throughout length (Fig. 33). *Character 6.* Harpe shape: 0) asymmetrical, right side with wide serrate apex, left side with a narrow rounded apex; 1) a swollen knob, smaller than ampulla (Fig. 29); 2) widest at base, angled toward costa at mid-length, narrower than ampulla (Fig. 31); 3) equal width throughout length, similar to ampulla (Fig. 33). *Character 7.* Cucullus apex shape: 0) asymmetrical, right side rounded with minute costal projection, left side rounded with elongate costal projection; 1) rounded (Fig. 29); 2) pointed (Fig. 31). *Character 8.* Apex of aedeagus: 0) pointed, with dorsal margin projecting beyond ventral margin into vesica (Fig. 29); 1) truncate, with dorsal and ventral margins equal (Fig. 33). *Character 9.* Vesica shape: 0) single, bulbous; 1) distal diverticula enlarged, bulbous (Fig. 30); 2) distal diverticula elongate, constricted medially (Fig. 32); 3) distal diverticula, tapered from base to apex (Fig. 36).

Female genitalia.—*Character 10.* Sinus vaginalis shape: 0) a deeply invaginated groove; 1) well sclerotized laterally and ventrally, rectangular-shaped caudally (Fig. 37); 2) lightly sclerotized, half-circle

Table 1. Character matrix used in the phylogenetic analysis of *Cutina*.

Taxa	Characters											
	1	2	3	4	5	6	7	8	9	10	11	12
Outgroup	0	0	0	0	0	0	0	0	0	0	0	0
<i>C. albopunctella</i>	0	1	0	0	1	1	1	0	1	1	1	1
<i>C. distincta</i>	1	2	1	1	2	2	2	0	2	2	2	2
<i>C. aluticolor</i>	1	2	1	1	3	3	2	1	2	3	2	2
<i>C. arcuata</i>	1	2	1	1	3	3	2	1	3	3	2	2

shaped caudad (Fig. 38). 3) lightly sclerotized, crescent-shaped caudally (Fig. 39). *Character 11*. 8th sternite shape: 0) a half circle-shaped flap; 1) paired trapezoidal projections (Fig. 37); 2) paired kidney-shaped projections (Fig. 38). *Character 12*. Signa form: 0) spicules short and thick; 1) longer on anterior half of corpus bursae than posterior half (Fig. 37); 2) long on entire corpus bursae (Fig. 38).

RESULTS

All binary characters were coded as plesiomorphic in the outgroup. All multistate characters were coded using morphocline analysis. This resulted in a fully resolved tree with a length of 24, a C.I. of 100, and a R.I. of 100 (Fig. 45).

DISCUSSION

Cutina albopunctella is the basal taxon to all other species of *Cutina*. The similar shape of the uncus apex is most closely related to the overall uncus shape of the outgroup. The lateral projections on the tegumen are shared with the outgroup. Monophyly of the remaining species is established by eight character states (1, 2(2), 3, 4, 7(2), 9(2), 11(2), 12(2)). The clade of *C. aluticolor* + *C. arcuata* is defined by four character states (5(3), 6(3), 8, 10(3)). *C. arcuata* is defined by character 9(3).

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